

Two roots in mandibular canines; Root canal treatment: A Case Report

Dr. Amal Kanti Ghosh¹, Dr. Dipto De², Dr. Rohit Miglani³

¹Professor and Head, Department of Conservative Dentistry and Endodontics, Mithila Minority Dental College & Hospital, Darbhanga, Bihar, India

²Professor and Head, Department of Oral Pathology, Mithila Minority Dental College & Hospital, Darbhanga, Bihar, India

³Professor, Department of Conservative Dentistry and Endodontics, Mithila Minority Dental College & Hospital, Darbhanga, Bihar, India

Abstract: There is lot of anatomical variation in the mandibular canine. A clinical case report is presented to illustrate anatomical variation in the human mandibular canine. Endodontic treatment may sometimes fail because morphological features of the tooth adversely affect the treatment procedures. Many investigators have reported the anatomical variations associated with mandibular canines. Mandibular canines are recognized as usually having one root and one root canal in most cases, although approximately 15% may have two canals or sometimes two roots. This paper describes clinical case of mandibular canines with two roots and two canals.

Key learning points are:

- Clinicians should be aware of anatomical variations in the teeth they are managing, and should never assume that canal systems are simple.
- The majority of mandibular canines have one root and root canal, but 15% may have two canals, and a smaller number may have two distinct roots.

Keywords: Mandibular canine, two roots, anatomy, endodontic.

Introduction

The aim of endodontic treatment is the elimination of infection from the root canal and the prevention of reinfection (Sjögren et al 1990)¹ However, root canal treatment may fail because of factors including persistent infection of the root canal, unsatisfactory intracanal procedures that may lead to poor canal preparation, broken instruments and incomplete root canal fillings.^{2,3}

Morphological features of the tooth may also adversely affect endodontic procedures (Nair et al.1990).⁴ Many clinicians have the perception that a given tooth will contain a specific number of roots and/or canals. Careful evaluation of research material has, however, shown that variations in tooth morphology are common. Many investigators have reported on the anatomical variations associated with mandibular canines (Pineda & Kuttler 1972, Green 1973, Vertucci 1984, Laurichesse et al. 1986, Heling et al . 1995).^{5,6,7,8} The following clinical reports describe endodontic treatment of two mandibular canines with two roots and two canals.

Case report

A 17 year-old female presented with severe pain in the right mandible to the department of Pedodontics in Mithila Minority Dental College and Hospital, Darbhanga. The diagnostic radiograph showed a periapical lesion associated with tooth 43 and the presence of two roots (Fig. 1). The tooth did not respond to pulp testing procedures. Rubber dam was placed and access was achieved using a round diamond bur (ISO 801001016, Komet, and Lemgo, Switzerland). The pulp chamber was opened extensively to facilitate the location of the buccal and lingual canals. Working length was established radiographically for both canals (Fig. 2). The canals were instrumented with stainless steel K-files and reamers (Dentsply Maillefer, Ballaigues, Switzerland) using a step-back instrumentation technique (Schilder 1974). A 5.25% solution of sodium hypochlorite (Nicol 5, Ognà, and Milan, Italy) and 17% E.D.T.A. +0.2% cetrimide (Largal Ultra, Septodont, Saint Maitre, France) were used alternatively as irrigants at every change of instrument. The canals were filled by vertical condensation of warm gutta-percha (Fig. 3).



Figure 1: Preoperative radiograph of tooth 43 shows a periapical lesion and two roots



Figure 2: Diagnostic Working length: Files have been placed in the two canals



Figure 3: Final obturation of the root canals using vertical condensation of warm gutta-percha

Discussion

Knowledge of anatomic variations is essential because endodontic success is related to a thorough debridement of the root canal system. Mandibular canines are recognized as usually having one root and one root canal in the majority of cases (Laurichesse et al 1986). Pineda & Kuttler (1972)⁵, Green (1973) and Vertucci (1984)⁸ reported that 15% of mandibular canines presented with two canals with one or two foramina. In some uncommon cases, there may be two roots, and two or three root canals. Laurichesse et al. (1986)³ reported that 2% of mandibular canines presented with one root and two canals and that 1% had two roots and two canals. Heling et al. (1995)² described a rare case of a root canal retreatment in a mandibular canine with two roots and three canals.

Conclusion

Failure to control infection in the root canal system has an adverse impact on outcome. Clinicians therefore should be aware of anatomical variations in the teeth they are managing, and should never assume that canal systems are simple. The majority of mandibular canines have one root and root canal, but 15% may have two canals, and a smaller number may have two distinct roots, both of which should be identified and managed.

References

- [1]. Green D (1973) Double canal in single roots. *Oral Surgery, Oral Medicine and Oral Pathology* 35, 689–96.
- [2]. Heling I, Gottlieb-Dadon I, Chandler NP (1995) Mandibular canine with two roots and three root canals. *Endodontics and Dental Traumatology* 11, 301–2.
- [3]. Laurichesse JM, Maestroni J, Breillat J (1986) *Endodontie Clinique*, 1st edn. Paris, France: Edition CdP, 64–6.
- [4]. Nair R, Sjögren U, Krey G, Kahnberg KE, Sundqvist G (1990) Intraradicular bacteria and fungi in root filled, asymptomatic human teeth with therapy-resistant periapical lesion: a long-term light and electron microscopic follow-up study. *Journal of Endodontic* 16, 580–8.
- [5]. Pineda F, Kuttler Y (1972) Mesiodistal and buccolingual. Roentgen graphic investigation of 7275 root canals. *Oral Surgery, Oral Medicine and Oral Pathology* 33, 101–10.
- [6]. Schilder H (1974) Cleaning and shaping the root canal. *Dental Clinics of North America* 18, 269–96.
- [7]. Sjögren U, Hagglund B, Sundqvist G, Wing K (1990) Factors affecting the long-term results of endodontic treatment. *Journal of Endodontic* 16, 498–504.
- [8]. Vertucci FJ (1984) Root canal anatomy of the human permanent teeth. *Oral Surgery, Oral Medicine and Oral Pathology* 58, 589–99.